Wenjun Zheng

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Objective

Seeking challenging research and teaching position in computational molecular biology and theoretical biophysics at major universities or research institutes.

Education

2003	**PhD**
	Department of Physics, Stanford University
	GPA: 3.85
	Adviser: Prof. Sebastian Doniach
	Dissertation: "protein structure prediction aided by solution Xray scattering and crystallographic data"
2002	**Master of Science**
	Department of Computer Science, Stanford University
	GPA: 4.0
1998	**Master of Science**
	Institute of Theoretical Physics, Academia Sinica, P. R. China
	GPA: 3.9
	Adviser: Dr. Yue Yu
	Thesis: "Fractional quantum Hall effect and edge states"
1995	**Bachelor of Engineering**
	Department of Electronic Engineering, Zhejiang University, P. R. China
	GPA: 3.7

Employment

2003–now   **Postdoctoral Research Fellow**
Laboratory of Computational Biology, NHLBI, NIH
Activity: developed computational methods to analyze macromolecular dynamics.
Sponsor: Dr. Bernard Brooks

Personal

- Date of Birth: June 1, 1973
- Citizenship: P. R. China

Honors and Awards

1998   Stanford Graduate Fellowship
1998   President's Scholarship of Academia Sinica
1996   Elite Scholarship of Academia Sinica
1994   Guang Hua Scholarship
1993   Yao Yiming Scholarship
1993   Excellent Student Scholarship (Second Class)
1992   Excellent Student Scholarship (First Class)
1991   Freshman Scholarship (First Class)

Publications

Physics papers:

- **Wenjun Zheng**, Congjun Wu and Jiangping Hu, Chapter 10 in "Models and methods of high-T_c superconductivity" Vol.2, edited by J. K. Srivastava and S. M. Rao, Nova, New York (2003).
- **Wenjun Zheng**, Stripe phase in the presence of RVB spin liquid background, *Physica C.* **341-348**: 257 (2000).
- **Wenjun Zheng**, Stripe dynamics, global phase ordering, and quantum criticality in high-T_c superconductors, *Phys. Rev. B.* **62**: 4042 (2000).
- P. V. Bogdanov, A. Lanzara, S. A. Kellar, X. J. Zhou, E. D. Lu, **W. J. Zheng**, G. Gu, J. I. Shimoyama, K. Kishio, H. Ikeda, R. Yoshizaki, Z. Hussain, and Z. X. Shen, Evidence for an energy scale for quasiparticle dispersion in $Bi_2Sr_2CaCu_2O_8$, *Phys. Rev. Lett.* **85**: 2581 (2000).
- **Wenjun Zheng**, Luther-Emery stripes, resonating valence bond spin liquid background, and high T_c superconductivity, *Phys. Rev. Lett.* **83**: 3534 (1999).
- **Wenjun Zheng**, Yue Yu and Zhaobin Su, Phenomenological understanding of a transport regime with reflection symmetry in the quantum Hall system in a composite-fermion picture, *Phys. Rev. B.* **58**: 6740 (1998).

- **Wenjun Zheng**, The microscopic model of composite particles for 1/m FQHE edge excitations, its bosonization and the chiral condition, *Int. J. Mod. Phys. B.* **11**: 2661 (1997).
- Yue Yu, **Wenjun Zheng** and Zhongyuan Zhu, Microscopic picture of a chiral Luttinger liquid: composite fermion theory of edge states, *Phys. Rev. B.* **56**: 13279 (1997).
- **Wenjun Zheng** and Yue Yu, Temperature-dependent crossover in fractional quantum hall edges in the presence of Coulomb interaction, *Phys. Rev. Lett.* **79**: 3242 (1997).

Computational biology papers:

- **Wenjun Zheng** and Bernard Brooks, Normal modes based prediction of protein conformational changes guided by distance constraints, *Biophys. J.* (to be published in 2005).
- **Wenjun Zheng** and Bernard Brooks, Identification of dynamical correlations within the myosin motor domain by the normal mode analysis of an elastic network model, *J. Mol. Biol.* (to be published in 2005).
- **Wenjun Zheng**, Bernard Brooks, Sebastian Doniach, and Dave Thirumalai, Network of dynamically important residues in the open/closed transition in polymerases is strongly conserved, *Structure* (to be published in 2005).
- **Wenjun Zheng** and Sebastian Doniach, A comparative study of motor protein motions using a simple elastic network model, *Proc. Natl. Acad. Sci. U S A.* **100**:13253-13258 (2003).
- **Wenjun Zheng** and Sebastian Doniach, Protein structure prediction constrained by solution Xray scattering data, and structural homology identification, *J. Mol. Biol.* **316**: 173-187 (2002).

Research Interest

- Computational analysis of macromolecular dynamics.
- Protein structure modeling and protein folding.
- Bioinformatics.
- Theoretical biophysics.

Research Experience

- **Methods development for the analysis of macromolecular dynamics** (2003–now, at NIH):
  Developed method to analyze functionally relevant dynamical correlations and applied it to the study of force-generation mechanism in myosin motor; developed method to identify dynamically important residues and validated their evolutionary conservation based on sequence alignments.
- **Protein structure modeling** (2000–2003, with Prof. Doniach at Stanford):
  Built protein structural models with various levels of details; implemented a number of modeling methods (lattice models, fragments assembly, threading, and

secondary structures assembly), using protein structure and sequence databases (FSSP, PFAM, PDB etc) and related softwares (Blast, DALI, LGA, DSSP etc). Designed new fitness score using structural constraint from the solution X-ray scattering experiments. Participated in the fifth meetings on the Critical Assessment of protein Structure Prediction methods (CASP5), ranked among the top 20 groups.

- **Motor proteins dynamics** (2002–2003, with Prof. Doniach at Stanford): Performed a comparative study of the structure-function relationships for three motor proteins (kinesin, myosin, and F_1-ATPases) using an elastic network model.
- **Bioinformatics study of alternative splicing in kinase family** (2000, with Prof. Sakharkar from the Nanyang Technological University, at Stanford): Performed data mining of GENBANK using PERL script and FASTA.
- **High temperature superconductivity** (1998–2000, with Prof. Z-X. Shen at Stanford): Studied the mechanism of high temperature superconductivity in the framework of stripe phase.
- **Fractional quantum Hall effects and edge states** (1996–1997, with Dr. Yu at Institute of Theoretical Physics, Academia Sinica, P. R. China): Studied the theory of fractional quantum Hall edge states.

Teaching Experience

- Teaching assistant of Phys43 (Winter, 2000–2001)
- Teaching assistant of Phys45 (Spring, 2000–2001)
- Teaching assistant of Phys51 (Autumn, 2001–2002)

Duties: led group discussions and review sessions, graded problem sets and exams, held office hours.

Computer Skills

- **Computer science master training**: Programming languages, database systems, operating systems, computer architecture, artificial intelligence, algorithms and data structures, mathematical foundations of computer science, network.
- **Programming languages**: C, Java, PERL, MATLAB and formatting languages such as TeX/LaTeX. Writing more than 10 thousand lines of C code.
- **Operating systems**: Windows, Unix and Linux, networking programming, and systems programming.
- **Databases**: SQL, Oracle.

Academic Presentations

- Invited seminar, Nanyang Technological University in Singapore, Feb 28, 2003. "Protein structure modeling in the era of structural genomics".
- Invited seminar, Scripps Research Institute in San Diego, Jan 8, 2003. "Protein structure prediction aided by solution Xray scattering measurements".

- Invited seminar, University of Washington in Seattle, Dec 12, 2002.
  "Protein structure prediction aided by solution Xray scattering measurements".
- Invited seminar, National Institutes of Health, Oct 31, 2002.
  "Protein structure prediction aided by solution Xray scattering measurements".
- Poster presentation at 6th Annual International Conference on Research in Computational Molecular Biology (RECOMB 2002), Apr 18-21, 2002.
  "Protein structure prediction aided by small-angle Xray scattering data".
- Stanford Medical School Molecular Biophysics Seminar, Dec 12, 2001.
  "Protein structure prediction constrained by small-angle Xray scattering data".
- Poster presentation at 6th International Conference on Materials and Mechanisms of Superconductivity and High-Temperature Superconductors, Feb 20-25, 2000.
  "Stripe dynamics in an RVB spin liquid".

Professional Association Memberships

Member of the International Society for Computational Biology (ISCB)

References

Prof. Sebastian Doniach
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Stanford, CA 94305-4045, USA
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Dr. Bernard R. Brooks
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Prof. Devarajan Thirumalai
Institute for Physical Science and Technology
University of Maryland
College Park, MD 20742, USA
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